MWI 8621.1
REVISION A
EFFECTIVE DATE: August 22, 2001
EXPIRATION DATE: August 22, 2006

MARSHALL WORK INSTRUCTION

QS01

CLOSE CALL AND MISHAP REPORTING AND INVESTIGATION PROGRAM

DOCUMENT HISTORY LOG

Status (Baseline/ Revision/ Canceled)	Document Revision	Effective Date	Description
Baseline		3/27/00	
Revision	A	8/22/01	Document rewritten in its entirety.

1. PURPOSE

In accordance with NPD 8621.1, “NASA Mishap Reporting and Investigating Policy,” NASA policy is to report, investigate, and document NASA mishaps and determine the root cause(s) of NASA mishaps in order to develop and implement corrective actions. The purpose of this Directive is to explain the processes involved in close call and mishap reporting, investigation, and recordkeeping; explain how the program will be conducted in compliance with Occupational Safety and Health Administration (OSHA), NASA, and Marshall Space Flight Center (MSFC) requirements and policies; and establish responsibilities and guidelines for employees to prevent injury, illness, and loss or damage to NASA/MSFC property.

2. APPLICABILITY

This Directive is applicable to all persons on MSFC property and contractors involved in MSFC operations.

3. APPLICABLE DOCUMENTS

3.1 Marshall Engineers and Scientists Association (MESA) Agreement (see URL: http://mesa.msfc.nasa.gov/contract.htm)

3.2 MPG 1040.3, “MSFC Emergency Plan”

3.3 MPG 1440.2, “MSFC Records Management Program”

3.4 NPG 1441.1, “NASA Records Retention Schedules”

3.5 NPG 3792.1, “Plan for a Drug-Free Workplace”

3.6 MPG 3810.1, “MSFC Management of Workers’ Compensation Injuries”

3.7 NPD 8621.1, “NASA Mishap Reporting and Investigating Policy”

3.8 NPG 8621.1, “NASA Procedures and Guidelines for Mishap Reporting, Investigating, and Recordkeeping”

3.9 The Privacy Act of 1974, as amended, 5 U.S.C. 552a

4. REFERENCES

4.1 29 CFR 1910.1904, “Recordkeeping and Reporting Occupational Injuries and Illnesses”

4.2 29 CFR 1926.22, “Recording and Reporting of Injuries”

4.3 MPG 8715.1, “Marshall Safety, Health, and Environmental (SHE) Program”

4.4 NPG 8715.3, “NASA Safety Manual”

5. DEFINITIONS

The list below addresses the most commonly used mishap terms. For a complete list of terms see NPG 8621.1.

5.1 Appointing Official. The official authorized (see Appendix A) to appoint an Independent Investigator or Mishap Board. The Appointing Official is responsible for appointing an independent Mishap Board/Independent Investigator, providing administrative and logistical support to the Mishap Board/Independent Investigator, accepting the Mishap Board/Independent Investigator findings, directing the responsible organization to develop a Corrective Action Plan (CAP), approving the CAP, closing corrective actions, and producing a summary report of all mishap-related activities upon completion.

5.2 Approving Official. The official (see Appendix A) with the final responsibility to review and accept the NASA mishap investigation report as complete and in conformance with NASA policy.

5.3 Close Call. An occurrence in which there is no injury, no equipment/property damage equal to or greater than $1,000, and no significant interruption of productive work, but which possesses a high severity potential for any of the mishaps defined as Types A, B, or C Mishaps, Mission Failure, or Incident. A close call (although not technically considered a mishap) must be reported and investigated to find and correct the root cause(s) of the event before a recurrence results in serious harm. It is important that every NASA employee be continually reminded to look for and report close calls. In addition to the obvious benefit of preventing recurrence, people will develop a habit of vigilance that will help to eliminate the unsafe acts and unnecessary risk taking that is the primary causal factor of most mishaps.

5.4 Corrective Action Plan (CAP). A formal document addressing findings of investigations with emphasis on correcting the root cause of the mishap.

5.5 Corrective Actions. Changes to design processes, work instructions, workmanship practices, training, inspections, tests, procedures, specifications, drawings, tools, equipment, facilities, resources, or material that result in preventing, minimizing, or limiting the potential for recurrence of a mishap.

5.6 Costs. Direct costs of repair, retest, delay, replacement, or recovery of NASA materials including hours, material, and contract costs, but excluding indirect cost of cleanup and investigation.

5.7 First Aid. Any one-time treatment of minor scratches, cuts, burns, splinters, etc., which do not ordinarily require medical care, and any followup visit for the purpose of observation. Such one-time treatment, and followup visit(s) for the purpose of observation, is considered first aid even though provided by a physician or registered professional.

5.8 Incident Reporting Information System (IRIS). The mishap data base, maintained by the Safety and Mission Assurance (S&MA) Office, contains mishap investigation data and provides tools to track CAPs to completion, submits status and closure data to NASA Headquarters, and performs mishap trend analysis.

5.9 Lessons Learned. Knowledge or understanding gained by experience. The experience may be positive (a successful test or mission) or negative (a mishap or failure). A lesson must be significant (has real or assumed impact on operations); valid (is factually and technically correct); and applicable (identifies a specific design, process, or decision that reduces or limits the potential for failures and mishaps); or reinforces a positive result.

5.10 Lost Workday Case (Lost-time Injury/Illness). A nonfatal traumatic occupational injury that causes lost time from work beyond the day or shift on which it occurred; or a nonfatal nontraumatic illness that causes lost time from work or disability at any time.

5.11 Lost Workdays. The number of days (consecutive or not) after, but not including, the day of injury or illness during which the employee would have worked but could not do so; i.e., could not perform all or any part of his normal assignment during all or any part of the workday or shift because of the occupational injury or illness.

5.12 Medical Treatment. Includes treatment administered by a physician or by registered professional under the standing orders of a physician. Medical treatment does not include first aid treatment even though provided by a physician or registered professional personnel.

5.13 Mishap Closure. Final closure report submitted by the Appointing Official consisting of the revised and signed NASA Form 1627, "NASA Mishap Report," formal report where applicable, and the description or corrective action. The corrective action must be implemented for closure approval.

5.14 MSFC Flash Mishap Report. At MSFC, this report is equivalent to a NASA Form 1627A, "NASA Initial Safety Incident Report," and is used to quickly notify MSFC management that a mishap has occurred.

5.15 NASA Mishap. Any unplanned occurrence or event resulting from any NASA operation or NASA equipment anomaly, involving injury or death to persons, damage to or loss of property or equipment, or mission failure provided that a written agreement or contract between NASA and another party did not otherwise allocate operational control and corrective action responsibility. NASA mishaps are categorized as follows:

5.15.1 Type A Mishap. A mishap causing death, hospitalization of three or more patients (within 30 days) or damage to equipment or property equal to or greater than $1 million. Mishaps resulting in damage to aircraft, space hardware, or ground support equipment that meet these criteria are included, as are test failures in which the damage was unexpected or unanticipated.

5.15.2 Type B Mishap. A mishap resulting in permanent disability to one or more persons, hospitalization (within a 30-day period from the same mishap) of less than three persons, and/or damage to equipment or property equal to or greater than $250,000, but less than $1 million. Mishaps resulting in damage to aircraft, space hardware, or ground support equipment that meet these criteria are included, as are test failures in which the damage was unexpected or unanticipated.

5.15.3 Type C Mishap. A mishap resulting in damage to equipment or property equal to or greater than $25,000, but less than $250,000, and/or causing occupational injury or illness that results in a lost workday case. Mishaps resulting in damage to aircraft, space hardware, or ground support equipment that meet

these criteria are included, as are test failures in which the damage was unexpected or unanticipated.

5.15.4 Mission Failure. A mishap of whatever intrinsic severity that, in the judgment of the Enterprise Associate Administrator/Institutional Program Officer, in coordination with the Associate Administrator for S&MA, prevents the achievement of primary NASA mission objectives as described in the Mission Operations Report or equivalent document.

5.15.5 Incident. A mishap consisting of personal injury of less than Type C Mishap severity but more than first aid severity, and/or property damage equal to or greater than $1,000, but less than $25,000.

5.16 Responsible Organization. The NASA or contractor organization that had the mishap.

5.17 Root Cause. In a long chain of events leading to a mishap or close call, it is the first causal action or failure to act that could have been controlled systemically either by policy/practice/procedure or individual adherence to policy/practice/procedure.

6. INSTRUCTIONS

The following instructions are a general guide to plan, report, investigate, develop, and implement a CAP for a mishap. Detailed procedures for each phase are addressed in NPG 8621.1, “NASA Procedures and Guidelines for Mishap Reporting, Investigating, and Recordkeeping.”

6.1 Premishap Planning

6.1.1 Contingency Plans

6.1.1.1 Program/project managers develop contingency plans that define MSFC’s roles and responsibilities from the time a failure, accident, or incident occurs in their program/project until the investigation is complete (e.g., MSFC-SSCP-5-77, “MSFC Space Shuttle Contingency Plan,” and SSP 50190, “International Space Station Program Contingency/Mishap Action Plan”).

6.1.1.2 S&MA and MSFC’s Emergency Management Director review contingency plans.

6.1.2 Facility/Test Emergency Procedures

6.1.2.1 Building managers/test engineers develop emergency procedures when unique actions are required. An example is when test stand systems must be secured prior to admitting the fire department to the scene. Another example is when it is necessary for Protective Services to shut off all utilities following an incident that occurs after hours.

6.1.2.2 S&MA and MSFC's Emergency Management Director review the emergency procedures.

6.1.3 Special Case Considerations

6.1.3.1 Supervisors should periodically update emergency notification contact lists for their employees (e.g., telephone numbers of a spouse who needs to be notified following a serious injury). For MSFC directorates/offices, the Administrative Officer (or equivalent) should have an emergency notification contact list for their employees.

6.1.3.2 Supervisors shall make plans for evacuation for disabled employees and periodically practice/demonstrate these plans.

6.2 Initial Reports (DAY 1)

Each employee is responsible for reporting emergencies, unsafe or potentially unsafe conditions, mishaps, and close calls in the workplace. Employees are guaranteed freedom from restraint, interference, coercion, discrimination, or reprisal for exercising their rights.

6.2.1 To Report an Emergency

6.2.1.1 Dial "911" to report an emergency.

6.2.1.2 For fire/explosion call "911" and activate building fire alarm.

NOTE: Always play it safe with personnel injuries. Do not perform self-evaluations, seek medical evaluation and then notify management with all available information.

6.2.2 Initial Mishap Notifications

6.2.2.1 For Type A and B mishaps, the responsible manager shall notify the Center Director/Deputy Director and Director, S&MA, as soon as possible.

6.2.2.2 All onsite mishaps and close calls (including Types A and B) shall be reported within 4 hours to (256) 544-4357, Option "0" (NASA Information Support Center) or the MSFC Industrial Safety Department at (256) 544-4357, "Safety Option." This is the notice that initiates the MSFC Flash Report.

6.2.2.3 The NASA Information Support Center or MSFC Industrial Safety Department generate and distribute the MSFC Flash Mishap Report.

NOTE: Contractors shall report mishaps as specified in their contract (e.g., DRD No. STD/SA-MSR, "Mishap and Safety Statistics Reports").

6.2.2.4 S&MA shall report Type A and Type B mishaps to NASA Headquarters, Code QS, immediately and to the local OSHA Office within 8 hours. MSFC S&MA shall call Code QS (telephone numbers are (202) 358-0557 during normal duty hours and 1-866-230-6272 for after duty hours) and OSHA (1-205-731-1534 or 1-800-321-6742). Notification (confirmation) shall also be made to the NASA Safety and Risk Management Division that the oral report has been provided to OSHA. NOTE: The OSHA report shall include: (1) establishment name; (2) location of incident; (3) time of incident; (4) number of fatalities and/or number of hospitalized employees; (5) Center contact person and phone number; and (6) a brief description of the incident.

6.2.2.5 If it is suspected that a mishap resulted from criminal activity, the Office of Inspector General (OIG) and the Center's Office of the Chief Counsel or NASA Office of the General Counsel should be notified.

6.2.2.6 Contractor fatalities shall be reported to S&MA immediately and to their local OSHA offices within 8 hours.

6.3 Securing the Mishap Site

6.3.1 MPG 1040.3, "MSFC Emergency Plan," shall be the authority document for onsite mishaps when MSFC's emergency system is activated (i.e., "911" is called).

6.3.2 Protective Services' guards shall secure the site and take action to preserve the mishap site for the investigation.

6.3.3 S&MA ensures actions are taken to control the scene for protection of people and property. S&MA also requests photography lab support, if required.

6.3.4 If the mishap results in a death, personal injury requiring immediate hospitalization, or in damage estimated to be in excess of $10,000 to Government or private property, the supervisor should also refer to NPG 3792.1, “Plan for a Drug-Free Workplace,” to determine whether additional action outside the safety mishap reporting and investigating process should be taken.

6.4 Appointing the Mishap Board/Investigator

6.4.1 The Approving Official determines the mishap type and works with the Appointing Official to select the Mishap Board, Investigation Team, or Independent Investigator. NPG 8621.1 describes this process for the different mishap types (see Appendix A).

6.4.1.1 Any mishap board investigating an incident affecting unit employees represented by the Marshall Engineers and Scientist Association (MESA) will include a member appointed by the MESA President (reference Section 19.06 of the NASA/MESA negotiated agreement).

6.4.1.2 Ordinarily, only full-time Federal employees should be appointed as members of a Type A or Type B MSFC Investigation Board or Investigation Team. Contractor employees may be utilized as nonvoting consultants or advisors. Before a contractor employee is appointed as a member of any MSFC investigation board or team, the concurrence of the Chief Counsel's Office must be obtained. In those situations, the Chief Counsel's Office will consider the applicability of the Federal Advisory Committee Act (which does not apply when only full-time Federal employees are appointed).

6.4.1.3 An S&MA facilitator should be assigned to each MSFC mishap investigation to ensure the requirements of NPG 8621.1 and this Instruction are followed.

6.4.2 The Approving Official shall document (memorandum or management announcement) the members of the mishap board, investigation team, or independent investigator; its charter; and a due date for the mishap report (see Appendix B). An e-mail addressing these items is sufficient for Type C, incidents, and close calls with potential of C or less.

6.5 Investigation

6.5.1 Type A and B investigations shall be in accordance with the guidelines in NPG 8621.1.

6.5.2 Type C and below shall, as a minimum, include:

6.5.2.1 Collecting the evidence. Evidence includes: (1) employee and witness interview(s) (see Appendix C for the statement that must be provided to the witness); (2) photographs or sketches of the scene; (3) failed equipment; (4) procedures used; and (5) data tapes, diskettes, or records.

6.5.2.2 Determine what happened with emphasis on finding the "root cause."

6.6 Mishap Reports

6.6.1 The responsible organization shall submit NASA Form 1627 for the mishap or close call to S&MA within 6 calendar days. Typically, the NASA supervisor submits the form for an MSFC mishap and the contractor's safety officer or manager submits one for a contract mishap.

NOTE: Contractors shall report mishaps as specified in their contract.

6.6.2 For NASA employees who sustain personal injury as a result of a mishap, applicable worker's compensation forms shall be completed by the employee and supervisor then forwarded to S&MA within 2 days of the injury. Instructions are provided in MPG 3810.1, "MSFC Management of Workers' Compensation Injuries."

6.6.3 Type A and Type B Mishap Investigation Reports shall be submitted in accordance with instructions in NPG 8715.1, Section 4.2, "Mishap Report Acceptance and Approval." Type C, incident, and close call mishap investigation reports shall be submitted to S&MA within 30 calendar days unless originally tasked otherwise by the Appointing Official. Extensions should be requested in writing and submitted to the Appointing Official.

6.6.3.1 Type A and B mishap board reports shall use the format specified in NPG 8621.1.

6.6.3.2 Type C, incident, and close call shall use the format specified in Appendix D.

6.6.4 The Appointing Official will review the report in accordance with instructions in the appointment letter. The Appointing Official may not change or influence the mishap investigation report but may ask for clarification. The board chairperson or investigator is not required to make any changes to the report with which he or she does not agree. The Appointing Official, with the concurrence of the responsible local safety official, may reject the report and then charter a new investigation. If the Appointing Official accepts the report as meeting the intent of the appointment letter, it is sent to the Approving Official.

6.6.5 The Approving Official coordinates the report with the appropriate level NASA legal official, NASA import/export control official, NASA public affairs official, and any other NASA program or policy official(s) as appropriate for compliance with NASA policies. After successful coordination and resolution of any policy concerns, the Approving Official approves the report as being consistent with NASA policy. After approval, the report is returned to the Appointing Official and the Investigation Board/Investigation Team/Investigator is released.

6.6.6 The Appointing Official tasks the responsible organization to develop, finalize, and submit a CAP and the lessons learned. If a draft CAP is included with the report, it may be used as a starting point or as guidelines for forming a CAP. The final CAP and approved lessons learned will be completed and filed with the official approved report.

6.7 Corrective Action Plan

6.7.1 A CAP shall be developed for all mishaps and close calls by the responsible organization and submitted to the Appointing Official within 15 calendar days of receipt of the mishap investigation report (see Appendix E).

6.7.2 The plan shall address the recommendations in the mishap investigation report. Include actions to correct the situation that caused the mishap and prevent the same or similar mishap from reoccurring. The major objective is to address and correct the root causes for the mishap. The CAP should include:

6.7.2.1 Root cause(s) of the mishap.

6.7.2.2 A description of the corrective actions necessary to eliminate the causes.

6.7.2.3 Who is responsible for performing the action, or which NASA organization is responsible for ensuring the action is completed (if the action is to be performed for the responsible organization by a contractor or other NASA organization).

6.7.2.4 A completion date for each action, provided by the performing organization.

6.7.2.5 A matrix or other means of matching corrective actions to mishap root causes or findings.

6.7.3 The Appointing Official is responsible for the acceptance or rejection of the plan. The independent investigator/mishap board and the applicable S&MA organization shall support the Appointing Official in assessing the CAP, if requested.

6.7.4 If the plan is rejected, it is returned with comments to the responsible organization for revision and resubmittal. The Appointing Official determines the timeframe for resubmittal of the CAP.

6.7.5 If the plan is accepted, the Appointing Official will:

6.7.5.1 Direct the responsible organization(s) to implement the plan.

6.7.5.2 Provide the plan to S&MA for distribution to interested parties and formulation of S&MA assurance (audit) plan.

6.8 Implement Corrective Action Plan

6.8.1 Upon receipt of the CAP, organizations with assigned actions shall implement the approved CAP as directed by the Appointing Official. Typically the responsible organization(s):

6.8.1.1 Implement corrective actions as soon as possible and communicate completion to the Appointing Official and S&MA.

NOTE: All actions are considered open until the Appointing Official receives closure evidence, per the plan. The Appointing Official is totally responsible for the decision to close an action.

6.8.1.2 For offsite corrective actions that will take longer than 30 days to complete, formally document the long-term corrective action. Documentation shall address: (1) a

description of the long-term corrective action; (2) the reason the corrective action cannot be corrected within 30 days; (3) a description of temporary measures taken to control the hazard; and (4) the expected completion date.

6.8.1.3 As actions are completed, provide evidence of action completions to the Appointing Official and S&MA.

6.8.1.4 Status open corrective actions monthly. Send status to S&MA by the 15th of each month (contractors shall report mishaps as specified in their contract, e.g., DRD No. STD/SA-MSR, “Mishap and Safety Statistics Reports”).

6.8.2 S&MA shall track the corrective action performance and provide status to the Appointing Official and/or the Mishap Board, Investigation Team, or Independent Investigator.

6.9 Assess Corrective Action Plan Effectiveness

6.9.1 S&MA will periodically assess the responsible organization to determine compliance with the approved CAP.

6.9.2 Compliance and noncompliance are communicated to the responsible organization(s) and the Appointing Official, if appropriate.

6.9.3 S&MA shall assess the corrective action and determine if it has corrected the situation as intended. If so, the corrective action and its resolution should be considered as a candidate for lessons learned. The method for documenting lessons learned is provided in NPG 8621.1, Chapter 6.

6.9.4 If the corrective action has not provided the intended results, S&MA notifies the responsible organization. The responsible organization addresses the situation and takes additional corrective action. The Appointing Official is responsible for taking any action as a result of noncompliance.

6.10 To Close the Mishap

6.10.1 When all corrective actions are closed, the Appointing Official produces a mishap summary report. The mishap summary report includes:

6.10.1.1 Mishap Investigation Report.

6.10.1.2 CAP and any changes to the plan.

6.10.1.3 The final status of the corrective actions, including any final deviations from the plan (e.g., completion date changes, performing organization changes, etc.).

NOTE: It is not necessary to create a new report to fulfill this requirement. It is anticipated that only the final status will need to be developed for this deliverable. A suggested format for the mishap summary report is included in NPG 8621.1, Appendix H-7.

6.10.2 The mishap summary report is delivered to the responsible organization and S&MA.

6.10.3 S&MA shall distribute the report to other appropriate local organizations, NASA Headquarters, other NASA Centers, and other Federal agencies. At this point, the Appointing Official has met his/her obligations for this mishap and is released from this position.

7. NOTES

None

8. SAFETY PRECAUTIONS AND WARNING NOTES

Mishap scenes can be hazardous. Before anyone is allowed onsite, responsible organizations or the Incident Commander shall determine the hazards (e.g., hazardous materials and chemicals, radiation, blood borne pathogens, etc.) and needed precautions are taken to make the scene safe.

9. RECORDS

9.1 A typical mishap has the following records:

9.1.1 MSFC Flash Mishap Report

9.1.2 Management Announcement (MA) or Memorandum - identifying the members of the mishap board, investigation team, or independent investigator; their charter; and a due date for the mishap report

9.1.3 NASA Form 1627, “NASA Mishap Report”

9.1.4 Mishap Investigation Report

9.1.5 Corrective Action Plan (and changes)

9.1.6 IRIS files (including corrective action log)

9.1.7 Mishap Summary Report

9.2 Mishap records and reports shall be handled in accordance with the Privacy Act of 1974.

9.3 The S&MA uses IRIS to maintain records of all mishaps and close calls, track corrective actions to completion, to submit status and closure data to NASA Headquarters, and to perform mishap trend analysis.

9.4 S&MA keeps mishap records in accordance with NPG 1441.1, “NASA Records Retention Schedules,” Schedules 1/119, 120, 121, 122.

10. PERSONNEL TRAINING AND CERTIFICATION

10.1 Training

10.1.1 The S&MA facilitator will complete NSTC 006, “MORT-Based Mishap Investigation,” or an equivalent course and be familiar with MWI 8621.1.

10.1.2 IRIS custodian will be familiar with this MWI, IRIS, recordkeeping requirements of NPG 1441.1, Schedules 1/121[1711]B and 1/122[1711], MPG 1440.2, and the records handling requirements of the Privacy Act of 1974.

11. FLOW DIAGRAM

See Appendix F.

12. CANCELLATION

MWI 8621.1 dated March 27, 2000

Original Signed by
Axel Roth for

A. G. Stephenson
Director

APPENDIX A
MISHAP MATRIX

Mishap Type	Definition/Decision	Appointing Official	Approving Official
Type A, Mission-Related, High-Visibility, Mishap	High-Visibility, Mission-Related Space Shuttle, International Space Station, or contingencies related to the processing and/or flight of payloads manifested on contract Expendable Launch Vehicles	NASA Administrator may activate the "Space Flight Operations Contingency Action Plan" or, if assigned the duty, the AA/OSMA appoints board	AA/OSMA Program is responsible for funding/support and corrective actions
High-Visibility, Type A Mishap Or Mission Failure/ Close Call	Death and/or three or more hospitalized within 30 days and/or property damage $1 million or greater Enterprise AA or AA HQ Operations and AA/OSMA decision	AA/OSMA can elect to be the appointing official of the mishap board	AA/OSMA Program is responsible for funding/support and corrective actions
Type A Mishap Or High-Visibility Mission Failure/ Close Call	Death and/or three or more hospitalized within 30 days and/or property damage $1 million or greater Enterprise AA or AA HQ Operations and AA/OSMA decision	AA will be the appointing official for the board with the approval of the AA/OSMA onboard selection	AA/OSMA Program is responsible for funding/support and corrective actions
Type B Mishap	Disability, and/or less than three hospitalized and/or property damage $\geq$ 250K to < $1 million	Center Director or Program Manager with concurrence of Center Safety Official and notification to Code QS	May be same as appointing official
Type C Mishap	Lost workday and/or property damage $\geq$ $25K to < $250K	Directorate Manager	Directorate Manager and Center Safety Official
Incident	Requires more than first aid and/or property damage $\geq$ $1K to < $25K	Department Manager	Department Manager and Center Safety Official
Center-Level Close Call	Possesses the potential to cause any type mishap, or any injury, damage, or negative mission impact	Supervisor	Department Manager and Center Safety Official
International Mishaps	Responsibilities and procedures for mishap investigation will be in accordance with the International agreement	Appointing official will be in accordance with the International agreement	Approving official will be in accordance with the International agreement

APPENDIX B
EXAMPLE INVESTIGATOR/INVESTIGATION TEAM ASSIGNMENT MEMORANDUM

TO: Distribution

FROM: AD20/Edwin R. Jones **[Appointing Official]**

SUBJECT: Investigation of Sulfuric Acid Spill at Building 4700

[Mishap Description] On July 26, 1999, an EG&G technician identified an acid spill within the containment at Building 4700, Deionized Water Facility. The technician notified his supervisor, and a hazardous waste response was immediately initiated. No injuries or hazardous release occurred outside the containment.

[Mishap Team Charter] An investigation team has been established to determine the cause of the mishap and make recommendations to minimize the probability of its recurrence. Ed Cornelius (AD) will chair the team, with Steve Cato (ED), Vyga Kulpa (QS), Rick Burnell (AD), and Farley Davis (AD) serving as members. The team's completed investigation report is expected no later than August 8.

[Mishap Report Due Date]. Please assure this team is given the assistance necessary to successfully carry out and conclude its investigation.

Edwin R. Jones
Manager
Facilities Engineering Department

APPENDIX C
STATEMENT TO WITNESSES

The purpose of this safety investigation is to determine the root cause(s) of the mishap that occurred on _____ and to develop recommendations toward the prevention of similar mishaps in the future. It is not our purpose to place blame or to determine legal liability. Your testimony is entirely voluntary, but we hope that you will assist the board to the maximum extent of your knowledge in this matter.

Your testimony will be documented and retained as part of the mishap investigation report background files but will not be released as part of the investigation board report.

NASA will make every effort to keep your testimony confidential and privileged to the greatest extent permitted by law. However, the ultimate decision as to whether your testimony may be released may reside with a court or administrative body outside NASA.

For the record, please state your full name, title, address, employer, and place of employment.

APPENDIX D

EXAMPLE MISHAP INVESTIGATION REPORT

TO: AD20/E. R. Jones ← ***Appointing Official***
THRU: AD23/R.E. Burns

FROM: AD23/R.E. Cornelius ← ***Investigation Team Chairperson***

SUBJECT: Investigation of Sulfuric Acid Spill at Building 4700

The investigation team has completed their investigation of the acid spill at Building 4700, and the results are as follows:

INCIDENT Description – At approximately 1:30 p.m. on July 26, 1999, an EG&G technician toured Building 4700. At this time, he checked the containment area and found a small amount of incidental water. At approximately 2:45 p.m., the technician returned to Building 4700. He immediately...

FINDINGS – The investigation of this incident revealed the following information:

1. The failure occurred at the acid discharge nozzle.

2. This acid tank had been previously repaired due to the failure of the interior coating before the Deionized Water Facility had been placed in service. That failure was determined .....

10. A visual inspection of the acid discharge nozzle indicated the top of the nozzle wall approximately 1-inch wide had been penetrated along the 6-inch length of the nozzle. .....

DISCUSSION – In order for the discharge nozzle to leak, the protective epoxy coating had to be breached thereby directly exposing the carbon steel to the acid. .....

For future applications, Ceilcote recommends inspecting the coating with a spark detector to locate pinholes and other defects. Ceilcote also recommends using fiberglass .....

ROOT CAUSE - The novalic epoxy coating failed due to pinholes. This was most likely the result of poor coating application on the inside diameter of the nozzle. This allowed corrosion to begin on the top .....

RECOMMENDATIONS – The investigation team recommends the following:

1. Evaluate the cost of repairing the existing tank versus receiving acid in 55-gallon drums ...

3. If the decision is made to manually handle the acid, perform a safety hazard analysis of the ....

CORRECTIVE ACTIONS – Although the fog items were not a cause for this incident, they should be addressed.

1. Return the pH meter to service ...

3. Several small repairs are need within the 4700 facility. ....

If you have questions or require additional information, please contact me at 544-xxxx.

Ed Cornelius
Investigation Team Chairperson

APPENDIX E

EXAMPLE CORRECTIVE ACTION PLAN (CAP)

TO: Distribution

FROM: AD20/E. R. Jones ← ***Appointing Official***

SUBJECT: Corrective Action Plan, Sulfuric Acid Spill at Building 4700

I have reviewed the final investigation report on the subject mishap and have assigned actions to close all recommendations and corrective actions per the enclosure.

Please let me know if the assigned estimated completion dates cannot be met, and we can extend them as necessary. Also, please inform Lane Pugh/AD21 of any date extensions and when each item is closed. She is maintaining a central file of all Facilities Engineering Department mishaps and close calls and will provide the Industrial Safety Office status information.

Edwin R. Jones
Manager
Facilities Engineering Department

Enclosure

Distribution:
AD22/
AD23/
EG&G/

cc:
AD23/Ed Cornelius ← ***Investigation Team Chairperson***
AD21/Lane Pugh
QS10/Vyga Kulpa

Enclosure

RECOMMENDATIONS – The investigation team recommends the following:

1. Evaluate the cost of repairing the existing tank versus receiving acid in 55-gallon drums ...
   Action: Kevin Primm/EG&G Estimated Completion Date: 10/15/99

CORRECTIVE ACTIONS – Although the fog items were not a cause for this incident they should be addressed.

1. Return the pH meter to service ...
   Action: Kevin Primm/EG&G Estimated Completion Date: 10/15/99

APPENDIX F
MISHAP PROCESS